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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/801,452

03/08/2001

Darrell Lee Ash

RFMI01-00214

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7590

07/22/2004

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Docket Clerk

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EXAMINER

KINKEAD, ARNOLD M

ART UNIT

PAPER NUMBER

2817

DATE MAILED: 07/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/801,452

Applicant(s)

ASH, DARRELL LEE

Examiner

Arnold M Kinhead

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 April 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,7-9,11,14-16 and 18-20 is/are rejected.
- 7) ☒ Claim(s) 3,5,6,10,12,13, and 17 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11-17-03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1,2,4,7,8,9,11,14-16, and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Futterer(U.S. 4,560,951 of record) and further in view of Gu et al(6,426,683 ^{of record} ~~new~~).

The reference by Futterer discloses a SAW resonator(see figure 2, and summary) which shows a SAWR with two port differential construct. Note the inductors across the two port circuit (L5,L4), the inductors being designed/specified as balanced inductances(see col. 4, lines 59-62, these required due to strongly capacitive input/output capacitance), also, a tunable SAW resonator with varactors (D2,D1), albeit hyperabrupt types; the capacitance of these diodes does affect the total capacitance of the equivalent circuit for the SAW. The inductors are coupled to ground. The differential amplifier stage and differential mode SAW resonator shown in figure 2 and common mode rejection is afforded such a construction. The method steps being inherent.

The reference does not specifically disclose inductances connected and sized to tune out stray capacitances. With regards this, it is an obvious design criteria that the inductance chosen for a particular frequency of operation, including the intrinsic stray capacitance and varactor diode tuning, and thus all reactances must be considered to allow for the desired frequency of operation for the oscillator. The tuning out of the stray capacitance will be considered in achieving the total capacitive component for determining the balanced inductances required. The

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varactor diodes(D1,2) have a control voltage(Us) but it is not clear how much of a role they play in setting frequency.

These conventional ideas are supported by the reference to Gu et al(US 6,426,683) as will be highlighted next.

With regard to the latter idea it is notoriously well known in the art that a resonator maybe made adjustable by adding a varactor that allows for tuning adjustments, see the reference by Gu et al, see figure 5, and col. 5, lines 1-20. The reference by Gu et al discloses a tuning circuit with a SAW resonator(s)(figure 5, 52...) with inductor element(65,67), and varactor(57, variable tuning cap; note this is in series with 52). Low phase noise is achieved by tuning out the stray capacitances with the use of inductor elements. The inductors coupled to ground.

In light of the above it would have been obvious for one of ordinary skill in the art to have modified the SAW resonator as shown in Futterer to include a varactor with a linear control, as shown by Gu et al, to allow for the tuning of the resonator as desired. Also, the inductors allowing for compensation against the inherent parasitic capacitances.

Allowable Subject Matter

I. Claims 3, 5, 6, 10,12, 13, and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The examiner could not find fair suggestion for the first and second resistors as in claims 5 and 12, no center tapped inductor is shown(claims 3,10, 17)load with an impedance lower than the stray capacitance...

Response to Arguments

1. Applicant's arguments filed 04-22-04 have been fully considered but they are not persuasive. The examiner has considered applicant's main concern about negating the parasitics (capacitance) in such resonant circuits as disclosed in Futterer and Gu et al (of record), however, Gu et al does discuss canceling parasitics, see col. 6, lines 18-25 and thus there is suggestion for removing such parasitics to allow better operation in the resonant filter circuit that is inherently formed by the structure shown. The Futterer reference seems to note difficulties in doing high frequency compensation (see col. 4, lines 59-62 due to strongly capacitive input/output capacitance). The use of hyper-abrupt varactor diodes does not prevent one of ordinary skill in the art from recognizing that more linear varactors produce a corresponding change in frequency as desired.

Allowable Subject Matter

II. Claims 4, 6, 7, 11, 13 and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The examiner could not find fair suggestion for the serially connected varactor coupled between the input port and a first port of the resonator and another varactor between the second port and the output port of the resonator; also, no load is suggested with an impedance lower than the stray capacitance...

Conclusion

2. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

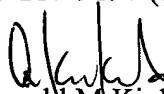
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arnold M Kinkead whose telephone number is 571-272-1763. The examiner can normally be reached on Mon-Fri, 8:30 am -5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on 571-272-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Arnold M Kinkead
Primary Examiner
Art Unit 2817

Arnold Kinkead
July 21, 2004